ABSTRACT OF THE DISCLOSURE

A programmable hardware per-pixel shading device for use in real-time 3D graphics applications containing additional asynchronous hardware units to assist in real-time per-pixel lighting. The standard programmable shading unit contains hardware for execution of a user-defined sequence of texture lookup and color blend operations. Programmable shader is assisted by a Vector Generation Unit responsible for generating normalized shading vectors and providing said vectors for use within said programmable shading unit. One or more Vector Shading Units operate in parallel with the programmable shading unit providing hardware accelerated lighting/color calculations and making results available for use in the programmable shading unit.

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